Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	8	**Sequence No.**	5	**Topic**	Atomic structure

Retrieval	Core Knowledge	Student Thinking
What do teachers need **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
Year 7: Separating mixtures topic. Students learnt the difference between an element, compound and mixture.	**L1: Atoms and molecules.** Reminder that atoms make up everything around us. An element is only made up of one type of atom. New content: A molecule is a group of atoms joined together by chemical **bonds**. Individual molecules are given a formula which tell you how many atoms of each element are in that particular molecule. Chemical symbols are used for each different element. A compound contains atoms of different elements chemically joined to each other. **L2: Elements.** There have been various ideas of what an element was over time. The ancient Greeks thought that there were just 4 elements; earth, air, fire and water. All known elements can be found in the periodic table. The periodic table is split into two, the **metals and non-metals**. Each element has its own **symbol**, for example O for oxygen, C for carbon. When writing symbols, the first letter is always a capital letter and if there is a second letter, it is always lower case. The symbols for elements could have come from its Latin name, from a place, after a famous scientist or after a property. Elements can exist as two atoms joined together. The human body is made up from approximately 20 elements. **L3: Classification of elements.** The periodic table is separated into numerical **groups** (vertical columns) and **periods** (horizontal rows). The elements in groups are linked by their similar **chemical behaviour**. The periodic table is also separated into metals and non-metals. Certain groups in the periodic table have specific names. Group 1 are called the **alkali metals**, the block of metals in the middle without a group number are called **transition metals**. Group 7 are called the **halogens** and group 0 are called the **noble gases**. New elements are discovered all the time, from ancient times to present day. **L4: Sub-atomic particles.** Over time, different scientists have come up with a hypothesis to explain what the atom consists of/looked like. Scientists now know that the atom consists of three smaller particles (**sub-atomic particles**) called **protons, neutrons and electrons**. The electrons have a negative charge and	L2: When two different groups discover an element and it comes to the decision of what to name it, IUPAC (International Union of Pure and Applied Chemistry – an international body that represents chemistry and related sciences and technologies) invites both groups to agree on a suggested name and symbol. If they cannot come up with a name within six months, they will decide for them. The US and USSR argued about the naming of elements in the cold war. L3: Mendeleev gets credit for 'discovering' the periodic table but the inspiration and data used came from Amedeo Avogadro, Johann Wolfgang Dobereiner and Stanislao Cannizzaro. Newland, another

	can be found in shells around the edge of an atom. The **nucleus**, which is in the centre of the atom contains two types of sub-atomic particles, the **protons** which are positively charged and the **neutrons** which have no charge, they are neutral. Two important properties that we use to describe these sub-atomic particles are **mass and charge**. Protons have a charge of +1 and a mass of 1. Electrons have a charge of -1 and a mass which is described as 'very small' and neutrons which have a charge of 0 and a mass of 1. In an atom of a particular element, there are always the same number of protons, this never changes. The numbers of protons, neutron and electrons in an atom can be found on an elements nuclear symbol on the periodic table. The **atomic number** (bottom number) is the number of protons. The number of neutrons can be found from the **mass number** (top number) which tells us the number of protons and neutrons. To find the number of neutrons, mass number – atomic number. **L5: Chemical reactions.** There are several physical indicators that can be observed when a chemical reaction has occurred. These include a **temperature change**, the reaction could release heat or become cold to the touch. Another indicator is that a **gas being released** is observed (usually seen as bubbles in an aqueous reaction) or a **precipitate (solid)** has been formed. The observer can also see a **colour change** or **light** being emitted. In reactions, the starting substances are called **reactants** and the end substances are called **products**. We can show how the atoms are rearranged in a chemical reaction using **word equations** which show the reactants on the left-hand side and the products on the right separated by an arrow facing forward. **L6: GPA – Combining iron and sulfur.** Using the content learned in the previous lessons, a specific reaction of sulfur and iron is looked at in more detail. Before the two elements are reacted together, they have several similarities and differences. Similarities include that they are both **solids**, can both be in powder form and are both classed as **elements**. As elements they have different **properties**, iron is a metal where as sulfur is a non-metal. They have different **appearances**; sulfur is a yellow powder and iron is grey. Iron is a **magnetic** metal and sulfur is not. Sulfur will burn easily where as iron will not.	scientist who is credited with an earlier periodic table also predicted the existence of other elements but this does not get taught, more emphasis is placed on Mendeleev predicting the existence of other elements.
Year 7: Separating mixtures topic. Students learnt how to name compounds.	**L7: Naming compounds.** The periodic table can be split into two types of elements, **metals and non-metals**. Only elements can be found on the periodic table. Compounds occur from the **chemical reaction** between two or more elements. We use symbols to show what elements a compound is made up from. There are rules when it comes to naming compounds. Rule 1: If there is a metal, the **metal always comes first**. Rule 2: After the first metal or non-metal, the ending of the second non-metal needs to change to ***-ide*.** Rule 3: If there is a metal, a non-metal and oxygen, the ending of the non-metal changes to ***-ate*.** Rule 4: Sometimes there is more than 1 atom and a prefix is used to tell you how many of these atoms are in the compound.	

Year 7: Separating mixtures topic. Students learnt the different physical methods used to separate substances.	**L8: Oxides.** Oxides are compounds that contain the element oxygen, in existence are metal oxides and non-metal oxides and they can have different properties. Magnesium, a shiny solid, when lit will produce a bright white light, the resulting magnesium oxide is a white ash. Metal oxides are **basic** in nature and react with water to form **alkaline** solutions. Not all metal oxides react with water, these are called **bases** and will be **insoluble**. Non-metal oxides are **acidic** and will react with water to form **acids**. **L9: Compounds ending in 'ate'.** In lesson 7 students learnt how to name simple compounds. If a compound ends in 'ate' then it consists of a metal, a non-metal and oxygen. This lesson is a recap of this specifically looking at copper sulfate. Copper oxide is added to sulfuric acid and heated up to form copper oxide. The practical involves several separation methods including filtration, evaporation and crystallisation. The resulting copper sulfate are observed as blue crystals. **L10: Revision** **L11/12: EOTT and development lesson**	